

Compensatory Mitigation

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1. Applicability. This SOP is applicable to regulatory actions requiring compensatory mitigation for adverse ecological effects where more rigorous, detailed studies (e.g., HGM, WET, HEP) are not considered practical or necessary. This SOP does not address mitigation for categories of effects other than ecological (e.g., historic, cultural, aesthetic). Types of mitigation other than compensation (e.g., avoidance, minimization, reduction) are not addressed by this SOP. This SOP was developed in coordination with State and Federal agencies to enhance its effectiveness and acceptability. When this SOP is used in the establishment of a Mitigation Bank, the ACE will consult with the Mitigation Bank Review Team (MBRT), in accordance with MBRT procedures, with the goal of achieving a consensus of the MBRT regarding the factors, elements, and design of the Mitigation Bank Plan. Also, note that this document is subject to periodic review and modification.

2. Purpose. The intent of this SOP is to provide a basic written framework which will provide predictability and consistency for the development, review, and approval of compensatory mitigation plans. A key element of this SOP is the establishment of a method for calculating mitigation credits. While this method is not intended for use as project design criteria, appropriate application of the method should minimize uncertainty in the development and approval of mitigation plans and allow expeditious review of applications. However, nothing in this SOP should be interpreted as a promise or guarantee that a project which satisfies the criteria or guidelines given herein will be assured of a permit. The District Engineer (DE) has a responsibility to consider each project on a case by case basis and may determine in any specific situation that authorization should be denied, modified, suspended, or revoked. This SOP does not obviate or modify any requirements given in the 404(b)(1) Guidelines or other applicable documents regarding avoidance, sequencing, minimization, etc. Such requirements shall be evaluated during consideration of permit applications.

3. Other Guidance. In addition to the policies and requirements set forth in this document, there may be other guidance provided by State or Federal agencies. For projects impacting less than one acre of waters of the United States, compensatory mitigation plans will usually be considered acceptable which have been approved by the State or NRCS, when applicable. Projects impacting more than one acre of United States waters will usually have to satisfy the requirements of this document in addition to any requirements imposed by the State. The policies and regulations regarding mitigation are still evolving and it is possible that conflicting guidance may occasionally be provided. Efforts have been made in the preparation of this document to minimize or eliminate such discrepancies. If a significant conflict is discovered between this document and any other relevant guidance, the applicant should notify the ACE of the conflict and request clarification before incorporating any such guidance into a proposed plan.

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4. Mitigation Equation. When a mitigation plan is required, it will be evaluated by the following equations. These calculations are not intended to represent an exact or statistically proven scientific method. Rather, the method is based on the judgment of regulatory and resource agency staff. It is intended to establish a clear, understandable, and consistent method for use by applicants and regulators. The definitions and explanations for all values and factors used in these equations are provided as *Attachment A*. Factor tables and sample worksheets are provided as *Attachment B* and example cases demonstrating the method are provided as *Attachment C*. As additional experience with this procedure is gained, it is possible that the tables of factors will be reviewed and adjusted. When using these equations use the most recent approved edition of these tables.

For those who desire a deeper understanding of the procedure, the following discussion and details are provided. Simply stated, the mitigation equation requires that for a mitigation proposal to be acceptable, the Proposed Mitigation Credits (PMC) must be equal to or greater than the Required Mitigation Credits (RMC). *Also, in accordance with the goal of no net loss of wetland functions, the portion of the PMC resulting from restoration, creation, or enhancement must be at least 50% of the RMC.* The mitigation credits for RMC and PMC are calculated using the options and factors given in the attachments.

$$\text{PMC} \geq \text{RMC}$$

And,

$$\text{PMC}_{\text{non-preservation}} \geq \frac{1}{2} \times \text{RMC}$$

$$\text{PMC} = \sum_{i=1}^n (M_i \times A_i)$$

$$\text{RMC} = \sum_{i=1}^N (R_i \times \text{AA}_i)$$

$$M_i = \sum_{i=1}^j m_i$$

$$R_i = \sum_{i=1}^k r_i$$

PMC = Proposed Mitigation Credits

A_i = The i^{th} area of mitigation

M_i = mitigation multiplier for A_i

m = mitigation factor

n = number of mitigation areas

j = number of mitigation factors

RMC = Required Mitigation Credits

AA_i = The i^{th} adverse effects area

R_i = adverse effect multiplier for AA_i

r = adverse effect factor

N = number of adverse effect areas

k = number of adverse effect factors

The RMC and PMC are each a summation of products. To calculate each product, one should first evaluate the areas under consideration and lump similar areas. It is appropriate to lump adverse effects areas (AA_i) which involve the same adverse effect factors (r_i). Similarly, it is appropriate to lump mitigation areas (A_i) which involve the same mitigation factors (m_i). For example, if there are four separate adverse effects areas but they are all to be filled, are all Type B wetlands, all fill will be permanent, and all work has a low preventability rating then the four areas can be lumped for purposes of calculating the RMC. Such lumping is just for mathematical simplification and will not effect the resulting calculations. The adverse effects multipliers (R_i) for an area (AA_i) are calculated by summing the applicable adverse effect factors (r_i) selected from the attached tables. Similarly, the mitigation multipliers (M_i) for a mitigation area (A_i) are calculated by summing the applicable mitigation factors (m_i) selected from the attached tables. The math is much simpler than the explanation.

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Each category of mitigation (restoration, creation, etc.) has a table of factors which are used to compute the credit multipliers for each unique mitigation area. Sample worksheets are provided for documenting and comparing the calculated PMC and the RMC.

5. Variance Approval. The following formula and table establish levels of authority for approval of mitigation plans where the proposed mitigation does not satisfy the SOP. The variance shown in the table is the maximum variation which can be approved at the indicated level. This allowance for variance is intended for situations where the mitigation formula is found to be unreasonable or otherwise not in the public interest. This policy applies to approval of variances for the non-preservation PMC and the total PMC. *The Project Manager must document the reasons for any approved variances.*

$$\text{Variance} = 100 \times \frac{\text{Required} - \text{Proposed}}{\text{Required}}$$

| Variance | Approval Authority |
|-----------|--------------------|
| up to 25% | Project Manager |
| up to 50% | Section Chief |
| up to 75% | Branch Chief |
| over 75% | District Engineer |

6. Processing Procedures.

6.1. Information required. The following information may be required for consideration of a mitigation proposal. Applicants are encouraged to provide several copies of proposals (usually eight) to expedite agency notification. Proposals will be reviewed and the applicant will be advised what additional information will be required to make the proposal adequate for consideration. Other information may be needed as part of the General Permit Notification process, Individual Permit process, or State procedures. Those requirements are not addressed herein.

- Plans and detailed information regarding the work for which the mitigation is required.
- Drawings in accordance with the requirements given in this SOP.
- A proposed monitoring plan and a plan for documenting baseline conditions of the mitigation site.
- Names, addresses, and phone numbers for all parties responsible for mitigation and monitoring.
- A description of the existing conditions of all areas to be effected by the proposed mitigation.
- A description of the existing vegetative communities to be effected by the proposed mitigation.
- A narrative discussion of the key elements of the proposed mitigation plan.
- A schedule showing earliest start and latest completion dates for all significant activities.
- A listing of measurable success factors with quantifiable criteria for determining success.
- Definitions for all success factors and other significant terms used in the plan.
- Description of the equipment, materials, and methods required for execution of the plan.
- A management plan, if necessary, for any maintenance of the mitigation. (Note well Article 7)

6.2. Distribution. Generally, proposals with bound or voluminous information will not be distributed via public notice mailings in order to minimize reproduction and mailing costs. For projects with proposals which are fully shown on a few pages, the Project Manager may include the proposal with the public notice for the permit application. When the proposal is distributed via public notice it must be clearly labeled as the mitigation proposal. Only one original of the proposal need be submitted when it is to be distributed via the public notice.

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7. General Guidelines. Mitigation must be designed in accordance with the following guidelines.

7.1. Adverse Effects Area. The area of adverse effects as used in this document includes aquatic areas impacted by filling, excavating, flooding, draining, clearing, or other adverse ecological effects. Other categories of effects such as aesthetic, cultural, historic, health, etc., are not addressed by this document. As explained in the glossary, the term *effects* includes:

- Direct effects, which are caused by the action and occur at the same time and place.
- Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

7.2. Mitigation Area. In general, the adverse impacts and compensatory mitigation are geographically distinct areas. The aquatic area in which the adverse effects occur will generally not be given credits as part of the compensatory mitigation area. For example, if a pond is excavated in wetlands with a resulting wetland fringe, the wetland fringe is generally not considered compensation for the excavation impacts. Similarly, an impoundment of a riverine system with a resulting increase in open surface water area or wetland fringe is not considered compensatory mitigation for the adverse impacts to the impounded riverine system. Certain exceptions may be allowed on a case-by-case basis. For example, a temporary construction impact (e.g. coffer dams, access roads, staging areas) might be mitigated by restoration or preservation of the area, depending on the nature, severity, and duration of the impacts.

A compensatory mitigation area may not be given credits under more than one mitigation category nor credited more than once under any category. However, it is acceptable to subdivide a given area into sub-areas and calculate credits for each sub-area separately. For examples, a restored aquatic area donated to a conservancy organization may be credited as either restoration or preservation but not both. An aquatic area that is enhanced by improving hydrology and by buffering should be given one net enhancement credit calculation, not separate credits for both types of enhancement. An aquatic area that contains some restoration (e.g., plugging ditches) and some enhancement (e.g., improved hydrology) could either be subdivided into a restoration area component and an enhancement area component, or the entire area could be lumped together and given one net enhancement/restoration credit calculation. Whether or not an area is subdivided or lumped for the purpose of credit calculations is a case-by-case decision based on what is reasonable and appropriate for the given mitigation proposal.

7.3. Restrictive Covenants and Conservation Easements. In order for restrictive covenants to be considered acceptable they should be equivalent to the most recent edition of the sample provided as *Attachment D*. The sample is subject to change without notice. Obtain a copy of the most recent edition prior to use. Conservation easements will be reviewed for acceptability on a case-by-case basis. Covenants and easements must be duly recorded with the appropriate local entity (e.g., Register of Mesne Conveyances). In the event that restricted areas are sold or conveyed to another entity the restricted area must be clearly defined in appropriate documents utilized for that transaction. Review the sample covenants for examples of other requirements that may apply.

7.4. Preservation. Preservation mitigation must include restrictive covenants, conservation easements, or other approved protective measures setting the preserved areas aside as natural areas. In accordance with the goal of no net loss of wetland functions, it will usually not be allowed to provide a majority of the required mitigation by pure preservation. At least 50% of the required mitigation credit should be from restoration, creation, and/or enhancement (which includes enhancement by buffering).

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7.5. *Buffer Zones.* In order to assure that buffers serve the intended use in perpetuity, they should be protected by restrictive covenants or similar measures. Buffers without acceptable restrictions should not be considered in calculation of credits. Buffers should be of adequate width to serve the intended purpose. In calculating credits, only those portions of suitable width will be considered. Buffers which do not meet the minimum mean width requirements should not be included in calculating credits. Buffers or portions of buffers may be excluded from calculation of credits if they have compromised or questionable protection value due to shape, condition, location, excessive width, or other factors.

MINIMUM BUFFER ZONE WIDTHS FOR MITIGATION CREDIT [†]

| Adjacent Land Use Category | Minimum Mean Width |
|----------------------------|--------------------|
| Single Family Residential | 25 feet |
| Multi-Family Residential | 40 feet |
| Commercial | 50 feet |
| Industrial | 75 feet |
| Landfill | 75 feet |
| Other Categories | case-by-case |

[†] widths are based on linear, constant elevation measurement

If the buffer zone is protected by suitable restrictive covenants or similar measures then it may allow a portion of the buffered aquatic site to be given enhancement credit. Buffers are given indirect credits in the enhancement by buffering policy. *Buffers will usually not be given direct mitigation credits.* However, on a case-by-case basis, preservation credit may be allowed for any portion of a buffer zone which provides highly desirable protection. Approval of direct credit for buffers is intended to be a limited exception and should be used sparingly only in special cases. Such limited exceptions include buffers where the aquatic site is smaller in area than an appropriately sized buffer zone and protection of the aquatic area by buffering is highly desirable (e.g., small streams).

7.6. *Enhancement.* Except for enhancement by buffering, proposed enhancement mitigation plans must include the following additional information.

- An explanation of what values or functions are being enhanced and to what degree.
- A narrative description of how the enhancement will be accomplished.

7.6.1. *Enhancement by Buffering.* When a mitigation plan includes buffer zones which have acceptable restrictive covenants or other approved restrictive measures, and the buffered aquatic area is also preserved, then enhancement credit will be allowed for the buffered aquatic area. Buffers or portions of buffers may be excluded from calculation of credits if they have compromised or questionable protection value due to shape, condition, location, excessive width, or other factors. The aquatic area allowed for enhancement credit shall be calculated as follows.

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AREA FOR ENHANCEMENT CREDITS BY BUFFERING [†]

| Aquatic Area Protected by Buffer | Enhanced Aquatic Area Equals the Lesser of The Protected Aquatic Area OR |
|----------------------------------|--|
| more than 95% | 1.0 × The Buffer Area |
| 75 to 95% | 0.75 × The Buffer Area |
| 50 to 75% | 0.50 × The Buffer Area |
| 25 to 50% | 0.25 × The Buffer Area |
| less than 25% | Determined and allowed only on a case-by-case basis. |

[†] See discussion below for exceptions

An increase in the maximum area allowed for enhancement credit may be approved if information demonstrates that the enhancement effect is greater than the maximums shown in the table. Suitable information for approval of exceptions will be determined on a case-by-case basis (e.g., bank full width analysis for streams). Remaining portions of the preserved aquatic area are given preservation credits.

Buffers may not include aquatic areas. It is not allowable to designate aquatic areas as buffer in order to gain enhancement credit for the remaining aquatic area. The credited buffer must consist of uplands. In some cases, the protected aquatic area may include areas which cannot be preserved by the applicant, but which will be effectively protected by the designated buffer (e.g., rivers, streams, public waters).

7.7. Creation. In designing creation mitigation, the selection of high quality upland habitat for conversion will generally not be acceptable. Designers should use good judgment in selecting sites for wetland creation. For example, a cut-over area or former agricultural field would be ecologically preferable to a mature forested area as a candidate for alteration. Mature forested areas will generally not be approved as suitable creation areas. Generally, created mitigation sites must be protected by restrictive covenants or similar measures following the creation work.

7.8. Restoration. Generally, restored mitigation sites must be protected by restrictive covenants or similar measures following the restoration work. Proposals for restoration mitigation must include the following additional information.

- An explanation of what values or functions are being restored and to what degree.
- A narrative description of how the restoration will be accomplished.

7.9. Location. Where practicable and environmentally desirable, mitigation should be at or near to the project site and within the same watershed as the area of adverse impacts. Mitigation which fails to meet this standard will result in a lower credit calculation due to the kind and location factors in the tables. Distant or out-of-watershed compensatory mitigation must be approved on a case-by-case basis.

7.10. Scheduling. When practicable and feasible, mitigation should be completed prior to or concurrent with the adverse impacts. The preferred method is to complete mitigation prior to the commencement of the impacts. However, it is recognized that because of equipment utilization it may be necessary to perform the mitigation concurrent with the overall project. This is usually acceptable provided the time lag between the impacts and mitigation is minimized and the mitigation is completed within one growing season following commencement of the adverse impacts. Justification should be provided for schedules showing less than 50% completion of the mitigation prior to commencement of the adverse impacts.

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7.11. *Maintenance.* Mitigation plans which require perpetual or long-term human intervention will usually not be acceptable. Mitigation areas should be designed to be naturally sustaining following the completion of the mitigation. Care should be taken that hydrology is adequately considered since plans requiring an energy subsidy (pumping, intensive management, etc.) will normally not be acceptable. The goal is to achieve a natural state which does not depend upon maintenance. Plans with maintenance will be discouraged.

7.12. *Consultation.* To minimize delays and objections during the permit review process, applicants are encouraged to seek the advice of resource and regulatory agencies during the planning and design of mitigation plans. For creation proposals and other complex mitigation projects, such consultation may improve the likelihood of mitigation success and reduce permit processing time.

7.13. *Lakes, Ponds, and Impoundments.* Mitigation using lakes, ponds, and impoundments may be allowed as compensation for impacts to similar waterbodies. *Mitigation using lakes, ponds, or impoundments will generally not be acceptable as compensatory mitigation for adverse impacts to wetlands or riverine systems.* Enhancement credit may be allowed as compensation for impacts to similar waterbodies if buffer zones are established around the perimeter of the waterbody and the buffers have acceptable restrictions. Enhancement credits for buffered lakes and ponds shall be based on the tables for enhancement credits given in this document. It is understood that open surface waterbodies provide some valuable public interest factors such as storm water storage, fisheries habitat, or ground water recharge. Therefore, in recognition of this fact, the adverse effect factors for flooding and impounding have been adjusted relative to other factors.

7.14. *Riverine Systems.* **Compensatory mitigation for adverse impacts to riverine systems must be through in-kind mitigation unless approved otherwise on a case-by-case basis.** In-kind mitigation for stream beds and other flowing waterbodies includes restoration, enhancement, and preservation of similar waterbodies. Wetlands will normally be considered out-of-kind mitigation for impacts to flowing waterbodies. Approval of out-of-kind mitigation for riverine systems may be allowed if in-kind mitigation is not practicable or feasible taking into account the overall project needs, cost, logistics, the applicant's capabilities to perform the work, availability of suitable mitigation banks, and other pertinent information.

8. Monitoring and Contingency Plans. The applicant may be required to monitor the mitigation area for success and to provide written reports describing the findings of the monitoring efforts. Such reports will normally involve photographic documentation and information on species survival rates. Because of the many variables involved, no specific standards are set forth as a part of this policy. Instead, a monitoring plan should be submitted as a part of the mitigation proposal for review. Monitoring efforts should usually include periodic reviews in the first year and annually thereafter. For major mitigation projects, the plan should include contingency measures specifying remediation procedures which will be followed should the success criteria or scheduled performance criteria not be fully satisfied. Monitoring and contingency plans typically address the following items, as applicable.

- A narrative discussion of the key elements of the proposed monitoring and contingencies plan.
- Names and contact info for parties responsible for the monitoring and contingencies plan.
- A description of the baseline conditions (e.g., soils, hydrology, vegetation, wildlife).
- A schedule for monitoring activities and reporting.
- A listing of measurable success factors with quantifiable criteria for determining success.
- Definitions for success factors and other terms used in the plan.
- Descriptions of equipment, materials, and methods to be used.
- Proposed protective measures (e.g., restrictive covenants or conservation easements).
- Vegetation survival monitoring and contingency plan.

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- Hydrological monitoring and contingency plan.
- Designation of reference site.
- Proposed bonding.
- Alternative site provisions in case the mitigation site is determined unsuccessful.

9. Drawings. Mitigation plans should include drawings in conformance with the following.

a. Drawings must be provided on 8.5 x 11 inch paper. For major mitigation projects, plans should also be submitted on paper sized no smaller than 11 x 17 inch and no greater than 30 x 42 inch. Drawings must be clear, readable, and reproducible on standard, non-color office copiers. Each drawing sheet should include the following:

- an unused margin of no less than ½ inch;
- an appropriate graphic scale (when reasonable);
- all significant dimensions clearly indicated and annotated;
- title block with applicant's name, project title, site location, drawing date, and sheet number;
- a directional arrow indicating north;
- a clear, legible plan view indicating area sizes (e.g. square feet, acres) for all mitigation sites.

b. Location maps for the proposed activity must be included. Two maps are desired. A County road map and a US Geological Quadrangle map are preferred as sources. The location maps must show roads leading to the site and must include the name or number of these roads. The project latitude and longitude should be annotated on the maps. Each map must include a title block.

c. Plan views of the proposed mitigation must be included. These drawings must show the general and specific site location and character of all proposed activities, including the relationship of all proposed work to Waters of the United States in the vicinity of the project.

d. For ground disturbing mitigation work, cross section views must be submitted depicting the existing ground contours and the proposed finished contours.

e. All aquatic areas within the project boundaries (avoided, impacted, or mitigated) must be shown.

f. Mitigation areas must be shown (enhancements, creations, restorations, etc.).

g. A legend must be shown identifying cross-hatching, shading, or other marking techniques used.

h. A summary table with the quantity of each category of impacted area and each category of mitigation must be shown.

i. Show the ordinary high water line of effected and adjacent non-tidal open surface waterbodies.

j. Show the mean high tide line and spring high tide line of effected and adjacent tidal waterbodies.

k. If the plan involves dredging in navigable waters, the drawings must include:

- (1) The method of dredging;
- (2) The site and plans for disposal of the dredged material;
- (3) A description of the type, composition and quantity of the material to be dredged.

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1. If the plan includes the discharge of dredged or fill material into Waters of the United States or the transportation of dredged material, the drawings must include:

- (1) The source of the material;
- (2) A description of the type, composition and quantity of the material;
- (3) The method of transportation and disposal of the material;
- (4) The location of the disposal site.

m. For mitigation plans with more than ten acres of creation, restoration, enhancement (other than by buffering), or a combination thereof, certified topographic drawings showing the contours and elevations of the completed mitigation area may be required. The drawings should show types of plantings, locations of plantings, and all other structures and work which are a significant part of the mitigation.

10. Mitigation Banking. Proposals to establish mitigation banks will be processed in accordance with current joint state and federal processing procedures for the establishment and operation of mitigation banks. Proposals which include use of credits from a mitigation bank must normally comply with the requirements given in this SOP as well as any conditions or restrictions applicable to the bank. Sample worksheets for application of this method to mitigation banks are included in the attachments.

11. Glossary and References. The acronyms, abbreviations, and terms used in this document are in accordance with the definitions given in the ACE's SOP titled *Terminology and Definitions*. For the purposes of this SOP, certain additional terms are defined in the attachments and as follows:

ACE stands for US Army Corps of Engineers.

Adverse effects as used in this SOP means any adverse ecological effect on Waters of the United States including all filling, excavating, flooding, draining, clearing, or similar changes effecting U. S. Waters. Other categories of effects such as aesthetic, cultural, historic, health, etc., are not addressed by this SOP.

Aquatic site means any Water of the United States, including special aquatic sites such as wetlands.

BFW stands for Bank Full Width Analysis (see Rosgen, David L. 1994. "A Classification of Natural Rivers." CATENA Vol. 22 No. 3 - June 1994).

Buffer zone means an area designed to separate. As used in this SOP it refers to a defined area intended to separate and protect an aquatic area from upland development or adverse effects. If the buffer zone is protected by suitable restrictive covenants or similar measures then it may allow a portion of the buffered aquatic site to be given enhancement credit. Buffers or portions of buffers may be excluded from calculation of mitigation credits if they have compromised or questionable protection value due to shape, condition, location, excessive width, or other factors.

Compensatory mitigation means compensating for the adverse effects by replacing or providing substitute resources or environments. Categories of compensatory mitigation for ecological effects include creation, restoration, enhancement, and preservation.

DE stands for District Engineer.

DNR stands for the state Department of Natural Resources.

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Effect is defined by Webster to mean something that inevitably follows an antecedent (as a cause or agent). The Council on Environmental Quality (CEQ) has defined at 40 CFR Part 1508.8 that the words *impacts* and *effects* are synonymous and that *effects* includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Further, the CEQ stated that *effects* include:

- Direct effects, which are caused by the action and occur at the same time and place.
- Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.

This SOP is limited to evaluation of compensatory mitigation plans for adverse ecological effects. Mitigation for other categories of effects (e.g., historic, cultural, aesthetic) is not addressed in this SOP.

EPA stands for US Environmental Protection Agency.

FWS stands for US Fish and Wildlife Service.

HEP stands for Habitat Evaluation Procedures (see US Fish and Wildlife Service 1980. "Habitat Evaluation Procedures (HEP) Manual," 102 ESM, Washington, D. C.).

HGM stands for Hydrogeomorphic Methodology (see Brinson, M. M. 1993. "A hydrogeomorphic classification for wetlands," Technical Report WRP-DE-4, US Army Engineer Waterways Experiment Station, Vicksburg, MS.).

MBRT stands for Mitigation Bank Review Team. An interagency group designated to review and consult with proponents regarding Compensatory Mitigation Bank proposals.

Mitigate, as defined by Webster, means to cause to become less harsh or hostile, or to make less severe. The Council on Environmental Quality has defined at 40 CFR Part 1508.20 that *mitigation* includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the effected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or environments.

This SOP is limited to evaluation of compensatory mitigation plans for adverse ecological effects. Categories of mitigation other than compensation (e.g., avoidance, minimization, reduction) are not addressed by this SOP. However, before compensatory mitigation is considered, other categories of mitigation should be evaluated consistent with the sequence listed above. Applicants are encouraged to submit information demonstrating project planning and design followed this sequenced approach.

MOA stands for Memorandum of Agreement.

NMFS stands for National Marine Fisheries Service.

NRCS stands for Natural Resources Conservation Service.

NTIS stands for National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161. 703-487-4650 or 487-4780.

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NWP stands for US Army Corps of Engineers Nationwide Permit.

Riverine, as used in this SOP, means rivers, streams, and similar natural flowing waterbodies together with their associated adjacent wetlands and riparian zones.

SOP stands for Standard Operating Procedure.

Special aquatic sites means wetlands, mud flats, vegetated shallows, coral reefs, riffle and pool complexes, sanctuaries, and refuges as defined at 40 CFR 230.40 thru 230.45.

Threshold means the level, point, or value above which something is true or will take place and below which it is not true or will not take place. For the purposes of this SOP, the thresholds given herein are considered to be the level of adverse impacts caused by the proposed project above which the project fails to meet the conditions, limitations, restrictions, or other requirements specified in relevant laws or regulations.

WET stands for Wetland Evaluation Technique (see Adamus, Paul R., Stockwell, Lauren T., Clairain, Ellis J., Jr., Morrow, Michael E., Rozas, Lawrence P., and Smith, R. Daniel. 1991. "Wetland Evaluation Technique (WET); Volume I: Literature Review and Evaluation Rationale," Technical Report WRP-91-, US Army Engineer Waterways Experiment Station, Vicksburg, MS.).

12. Signature Authority. All letters regarding Mitigation Plans subject to this SOP will be signed at the appropriate authority level indicated below. Any letters which do not fall into one of the categories listed below shall be signed by the District Engineer or his designated representative.

12.1. *Routine Actions.* The following categories of letters regarding projects subject to this SOP are considered routine actions and may be signed by Project Managers. Letters falling into a category listed under Articles 5, 12.2, or 12.3, shall be signed at the level indicated in that article.

- a. Letters responding to requests for information.
- b. Letters requesting additional information from applicants.
- c. Letters responding to requests for delineations or verification of delineations.
- d. Letters approving mitigation monitoring reports, except for mitigation bank monitoring reports.

12.2. *Standard Actions.* The following categories of letters regarding projects subject to this SOP are considered standard actions and will be signed by the Chief of the Permit Evaluation Section. Letters falling into a category listed under Articles 5, 12.1 or 12.3, shall be signed at the level indicated in that article.

- a. Letters approving mitigation plans.
- b. Letters resolving enforcement actions.
- c. Letters approving mitigation bank monitoring reports.

12.3. *Special Actions.* The following categories of letters regarding projects subject to this SOP are considered special actions and shall be signed by the District Engineer or his designated representative.

- a. Letters of denial, disapproval, suspension, or revocation.
- b. Letters authorizing or approving a mitigation plan after any resource agency has recommended that the mitigation plan be disapproved.

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c. Letters imposing special conditions regarding a mitigation plan or modifications to a mitigation plan to which the applicant has not agreed.

d. Letters authorizing or approving a mitigation plan when the proposed plan deviates significantly from the policies and guidance given in this SOP, excluding variances covered in Article 5 of this SOP.

e. Letters for which signature authority has not been delegated to a subordinate level. For example, letters needing DE signature pursuant to the requirements of an interagency MOA.

13. Point of Contact. Copies of this document are available at Charleston District's Regulatory web site (<http://www.sac.usace.army.mil/permits>) on the Internet's Worldwide Web. Questions regarding use of this policy for specific projects must be addressed to the Project Manager handling the action. Other inquiries or comments regarding this document should be addressed to:

U. S. Army Corps of Engineers, Charleston District
Attn: Steven J. Coker, Environmental Engineer
P. O. Box 919
Charleston, South Carolina 29402
voice: 843-727-4330
e-mail: steve.coker@sac.usace.army.mil

14. Authorizing Signature. By the signature given below, this SOP is authorized for use.

Elmer Schwingen
Chief of Construction-Operations

Compensatory Mitigation Definitions of Factors

Control means the entity empowered or responsible for enforcing the preservation requirements. Related terms are:

Conservancy means a qualified, experienced, non-profit conservation organization or government agency.

POA means a property owners association or other similar, formally chartered, non-profit organization.

Private means a private individual or business enterprise.

Subdivided means more than one owner has separate ownership of a portion of the mitigation site.

Compensatory Mitigation for aquatic areas addressed by this SOP include:

Creation means the conversion of non-aquatic habitat to aquatic habitat. Wetland creation usually includes grading, providing a suitable substrate, hydrology, and establishment of appropriate vegetation.

Enhancement means increasing or improving one or more of the functions or values of an existing aquatic area.

Preservation means the conservation of an area to prevent its destruction or degradation.

Restoration means actions taken to correct previous alterations which have either destroyed or seriously impaired the values and functions of an aquatic area. An example of restoration is hydrological alteration followed by planting of appropriate wetland vegetation in a bottomland hardwood area that had previously been converted to another use, such as agriculture or silviculture.

Credit Schedule (i.e. Timing) means the relative time when the mitigation will be performed. *Mitigation schedules are reviewed and approved on a case-by-case basis.* Related terms include:

Schedule 1. For mitigation not involving banks it means that the mitigation is done prior to the adverse impacts. For Mitigation Banks this means that no credits may be withdrawn prior to final determination of success.

Schedule 2. For mitigation not involving banks it means the majority of the mitigation is done prior to the impacts and the remainder is done concurrent with or after the impacts. For Mitigation Banks this means that no more than 10% of the credits may be withdrawn prior to final determination of success.

Schedule 3. For non-banking mitigation it means the mitigation is concurrent with the impacts. For Mitigation Banks this means no more than 20% of the credits may be withdrawn prior to final determination of success.

Schedule 4. For mitigation not involving banks it means the majority of the mitigation is done concurrent with the impacts and the remainder is done after the impacts. For Mitigation Banks this means that no more than 30% of the credits may be withdrawn prior to final determination of success.

Schedule 5. For mitigation not involving banks it means the mitigation is done after the impacts. For Mitigation Banks this means that more than 30% of the credits may be withdrawn prior to final determination of success.

Degree of Threat is an assessment of the level of imminent risk of loss or damage to a system.

Dominant Effect categories are defined as follows.

Clear means to remove vegetation.

Draining means ditching, channelization, or excavation that results in the removal of water from an aquatic area causing the area, or a portion of the aquatic area, to change over time to a non-aquatic area or to a different type of aquatic area.

Dredge means to dig, gather, pull out, or excavate from U. S. waters.

Fill material means any material used for the primary purpose of replacing an aquatic area with dry land or of changing the bottom elevation of a waterbody.

Flood means to cover with an open-surface waterbody such as a lake or pond.

Impound means to create a lake or pond by obstructing the flow of a riverine system.

Shading means to shelter or screen by intercepting radiated light or heat.

Compensatory Mitigation Definitions of Factors

Duration means the length of time the adverse impacts are expected to last. *Seasonal duration* means that the adverse impacts are limited to times outside of applicable nesting, breeding, or growing periods.

Existing Conditions categories are defined as follows.

Class 1 means essentially pristine areas not impacted by human activities.

Class 2 means that adverse changes to the environment caused by human activities are short term and minor. For examples: existing small temporary access roads, minor dewatering (e.g. temporary coffer dams).

Class 3 means that adverse changes to the environment caused by human activities are short term and more than minor. For examples: existing large temporary access roads, major dewatering (e.g. temporary stream realignment).

Class 4 means that adverse changes to the environment caused by human activities are long term and minor. For examples: wetlands with minor ditching; low rise, fish passable weirs; wetlands with minor selective clearing.

Class 5 means that adverse changes to the environment caused by human activities are long term and more than minor. For examples: wetlands with major ditching; impounded streams; wetlands that have been extensively cleared.

Class 6 means that adverse changes to the environment caused by human activities are permanent. For examples: permanent fills, excavations in wetlands, cleared utility line easements in wetlands.

Hydrology, as used in this SOP, means the properties, distribution, and circulation of water on the surface of the land, in the soil, and underlying rocks. Related terms include:

Created hydrology means the permanent manipulation of the topography resulting in an ecologically significant change in the hydrology of the area.

Mechanical hydrology means the employment of mechanical methods (e.g., pumps) to supply water to an area thereby causing an ecologically significant change in the hydrology of the area.

Natural hydrology means the area's hydrology as it existed prior to the actions of modern man. Hydrology which has been restored to its natural state qualifies as natural hydrology. Examples of such restoration include effectively filling ditches which drain the area or removing berms which prevent inundation.

Kind is a factor used to compare the relative functions and values of the mitigation site to the impacted site. For Mitigation Banks, kind categories are defined for each bank unit after an assessment of the banking proposal. For proposals not involving mitigation banks, kind categories are In-Kind and Out-of-Kind. Related terms include:

Category 1 is **In-Kind for non-mitigation banks** and is specially defined for mitigation banks.

Category 2 is defined for each mitigation bank following an assessment of the bank.

Category 3 is defined for each mitigation bank following an assessment of the bank.

Category 4 is **Out-of-Kind for non-mitigation banks** and is specially defined for mitigation banks.

Category 5 is defined for each mitigation bank following an assessment of the bank.

In-kind Mitigation means the replacement of the impacted aquatic site with one of the same plant community type (same species composition). However, if the new ecosystem has more desirable functions and values than the impacted ecosystem then the mitigation may be considered in-kind for calculation of mitigation credits.

Out-of-kind Mitigation means the replacement of an impacted aquatic site with one of a different plant community type (different species composition). For example, if a wooded swamp habitat is filled or altered and the mitigation consists of grading an area and planting it in freshwater emergent marsh species, this would be out-of-kind.

When an exception is approved to allow mitigation credit for buffer zones, the buffers are given a value of zero for the kind factor. Mitigation Banks shall not be used as compensatory mitigation for areas which do not clearly fit into one of the bank's assigned categories unless approved on a case specific basis in accordance with the banking agreement.

Compensatory Mitigation Definitions of Factors

Location is a factor used to compare the relative location of the mitigation site to the impact site. For Mitigation Banks, Zones will be defined for the bank after an assessment of the banking proposal. For mitigation proposals not involving mitigation banks, location categories are as shown below. Related terms include:

Zone 1 means **On-Site for non-mitigation banks** and is specially defined for mitigation banks.

Zone 2 means **Inside for non-mitigation banks** and is specially defined for mitigation banks.

Zone 3 is defined for each mitigation bank following an assessment of the bank.

Zone 4 means **Outside for non-mitigation banks** and is specially defined for mitigation banks.

Zone 5 is defined for each mitigation bank following an assessment of the bank.

On Site means within or adjacent to the project boundaries and within the impacted watershed.

Inside means within the impacted watershed.

Outside means outside of the impacted watershed.

When an exception is approved to allow mitigation credit for buffer zones, the buffers are given a value of zero for the location factor. Mitigation Banks shall not be used as compensatory mitigation for impacts which are outside of the bank's assigned zones unless approved on a case specific basis in accordance with the banking agreement.

Lost Kind categories are based on functional values and are defined as follows.

Kind A Riverine systems, bottomland hardwoods, emergent marsh, intertidal zones.

Kind B Isolated wetlands, pond pine wetlands, seeps and bogs, savannahs, subtidal zones.

Kind C Loblolly or slash pine dominated pine flatwoods.

Kind D Lakes and impoundments.

Kind E Naturalized borrow pits.

Other habitat types not categorized above will be evaluated and assigned a category ranking by the Project Manager on a case-by-case basis with consideration of any comments provided by resource agencies.

Magnitude is an evaluation of the cumulative adverse impacts to aquatic sites for the overall project. This factor is proportional to the acres of impact. The formula used to calculate this value is $0.05 \times \sum AA_i$ where $\sum AA_i$ stands for the sum of the acres of adverse impacts to aquatic areas for the overall project. When computing this value, round to the nearest tenth decimal place using even number rounding. Thus 0.01 and 0.050 are rounded down to give a value of zero while 0.051 and 0.09 are rounded up to give 0.1 as the value for the magnitude factor.

Maintenance means any long term or perpetual manipulation or action after completion of the monitoring period which is necessary to achieve the mitigation goal. Remedial or planned work during the monitoring period is not considered maintenance but is rather just a part of the mitigation work. Minimal (low level) maintenance includes weeding or removal of unwanted species. Moderate maintenance includes some replanting of the desired vegetation. High level maintenance includes significant replanting, addition of soils, hydrology manipulation, or other similar actions.

Monitoring & Contingencies (M & C Plans) means the actions which will be undertaken during the mitigation project to measure the level of success of the mitigation work and to correct problems or failures observed. Related terms include:

Contingencies means the actions which will be employed to correct deficiencies or failures found during the monitoring period and to achieve the specified success criteria.

Monitoring means the collection of field data to measure the success of a mitigation effort. It usually includes analysis of the data, and submittal of a comprehensive report containing the data, analyses, and a narrative discussion of the findings and conclusions.

Minimum Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring (unless approved otherwise)

Restrictive covenants and/or conservation easements

Compensatory Mitigation Definitions of Factors

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Moderate Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring

Restrictive covenants and/or conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Basic hydrological monitoring

Collection of suitable baseline data

Substantial Level Monitoring & Contingencies Plans will typically include the following elements:

At least 5 years of monitoring

Conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Extensive hydrological monitoring

Collection of suitable baseline data

Reference site comparison monitoring

Strong Level Monitoring & Contingencies Plans will typically include the following elements:

At least 7 years of monitoring

Conservation easements

Vegetation survival monitoring (including a commitment to replant if success is not achieved)

Extensive hydrological monitoring

Collection of suitable baseline data

Reference site comparison monitoring

Suitable bonding

Alternative site provisions if mitigation site is determined unsuccessful

Net improvement is an evaluation of the net level of enhancement or restoration of the impacted functions and values of an aquatic site. Adverse effects caused by the work must be considered in determining the net improvement.

Preventability is an evaluation of the degree to which the adverse effects could be prevented. This factor is intended primarily for Nationwide Permit mitigation. Individual Permits must also satisfy the 404(b)(1) guidelines regarding avoidance, minimization, etc. Preventability levels are defined as follows:

High means there may be practicable, less damaging alternatives that satisfy the purpose of the project. In the case of existing violations the presumption will be that there was high preventability unless demonstrated otherwise.

Medium means there may be alternatives but it is unclear if they satisfy the project purpose or if they are practicable.

Low means there are no known alternatives which satisfy the purpose, are practicable, and are less damaging.

Rarity Ranking categories are defined as follows.

Imperiled means that because of extreme rarity or rate of loss the designated category is either regionally or globally at risk of total loss or destruction. Adverse impacts to such areas generally should be avoided.

Vulnerable means that the designated category is expected to become imperiled if current trends continue.

Rare means that the designated category is seldom occurring and is marked by some special quality.

Uncommon means that the designated category is not ordinarily encountered or is of exceptional quality.

Common means that the designated category is frequently occurring or widespread in distribution.

The designated categories used in determining rarity rankings will be based on information furnished by the FWS or DNR or such other data as may be available. For unclassified categories the Project Manager will assign a rarity ranking on a case-by-case basis with consideration of any comments provided by resource agencies.

Compensatory Mitigation Definitions of Factors

Soil means the upper layer of earth which may be dug or plowed and in which plants grow. Related terms include:

Existing Suitable Soil (E. S. S.) means the appropriate use of soils existing at the mitigation site or contiguous with the site and which have been determined to be of a proper type for the proposed mitigation.

Transferred Suitable Soil (T. S. S.) means the appropriate use of soils imported to the mitigation site from a non-contiguous location which have been determined to be of a proper type for the proposed mitigation.

Unknown Suitability Soil (U. S. S.) means use of a soil type or source that is of unproven or uncertain suitability for the proposed mitigation.

Vegetation means the plant material within a defined area. Related terms used in this SOP include:

Natural vegetation involves no planting and allows spontaneous revegetation.

Planted means using transplanted or nursery stock vegetation.

Compensatory Mitigation Credit Factors and Worksheets

ADVERSE IMPACT FACTORS

| Factors | Options | | | | | | |
|---------------------|---|-----------------|------------------|------------------|------------------|------------------|-----------------|
| Magnitude | $0.05 \times \sum AA_i$ (rounded to the nearest tenth decimal place) | | | | | | |
| Dominant Effect | Fill 2.0 | Impound 1.8 | Dredge 1.6 | Drain 1.4 | Flood 1.2 | Clear 1.0 | Shade 0.5 |
| Duration of Effects | | 7+ years 2.0 | 5-7 years 1.5 | 3-5 years 1.0 | 1-3 years 0.5 | 0-1 years 0.1 | Seasonal 0.1 |
| Existing Conditions | | Class 1 2.0 | Class 2 1.5 | Class 3 1.0 | Class 4 0.5 | Class 5 0.3 | Class 6 0.1 |
| Rarity Ranking | | | Imperiled † | Vulnerable † | Rare 2.0 | Uncommon 0.5 | Common 0.1 |
| Lost Kind | | | Kind A 2.0 | Kind B 1.5 | Kind C 1.0 | Kind D 0.5 | Kind E 0.1 |
| Preventability | | | | High 2.0 | Moderate 1.0 | Low 0.5 | None 0 |

† These factors are determined on a case-by-case basis.

The following definition is reproduced here for ready reference.

Magnitude is an evaluation of the cumulative adverse impacts to aquatic sites for the overall project. This factor is proportional to the acres of impact. The formula used to calculate this value is $0.05 \times \sum AA_i$ where $\sum AA_i$ stands for the sum of the acres of adverse impacts to aquatic areas for the overall project. When computing this value, round to the nearest tenth decimal place using even number rounding. For example, 0.01 and 0.050 are rounded down to give a value of zero while 0.051 and 0.09 are rounded up to give 0.1 as the value for the magnitude factor.

Required Mitigation Credits Sample Worksheet

| Factor | Area 1 | Area 2 | Area 3 | Area 4 | Area 5 | Area 6 |
|--------------------|----------|----------|----------|----------|----------|----------|
| Magnitude | | | | | | |
| Dominant Effect | | | | | | |
| Duration | | | | | | |
| Existing Condition | | | | | | |
| Rarity Ranking | | | | | | |
| Lost Kind | | | | | | |
| Preventability | | | | | | |
| Sum of r Factors | $R_1 =$ | $R_2 =$ | $R_3 =$ | $R_4 =$ | $R_5 =$ | $R_6 =$ |
| Impacted Area | $AA_1 =$ | $AA_2 =$ | $AA_3 =$ | $AA_4 =$ | $AA_5 =$ | $AA_6 =$ |
| $R \times AA$ | | | | | | |

Total Required Credits = $\sum (R \times AA) =$

Compensatory Mitigation Credit Factors and Worksheets

CREATION MITIGATION FACTORS

| Factors | Options | | | | |
|-----------------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|
| Soils | | N. A. 0 | U. S. S. 0 | T. S. S. 0.1 | E. S. S. 0.3 |
| Hydrology | | N. A. 0 | Mechanical 0 | Created 0.1 | Natural 0.3 |
| Vegetation | | | N. A. 0 | Natural 0.1 | Planted 0.3 |
| Maintenance | | N. A. 0 | Moderate 0 | Low 0.1 | None 0.3 |
| Monitoring and Contingencies Plan | N. A. 0 | Minimum 0.1 | Moderate 0.2 | Substantial 0.3 | Strong 0.4 |
| Credits Schedule | Schedule 5 0 | Schedule 4 0.1 | Schedule 3 0.2 | Schedule 2 0.3 | Schedule 1 0.4 |
| Kind | Category 5 0.1 | Category 4 0.2 | Category 3 0.3 | Category 2 0.4 | Category 1 0.5 |
| Location | Zone 5 0.1 | Zone 4 0.2 | Zone 3 0.3 | Zone 2 0.4 | Zone 1 0.5 |

N. A. = Not Applicable

Proposed Creation Mitigation Sample Worksheet

| Factor | Area 1 | Area 2 | Area 3 | Area 4 | Area 5 |
|------------------|------------------|------------------|------------------|------------------|------------------|
| Soils | | | | | |
| Hydrology | | | | | |
| Vegetation | | | | | |
| Maintenance | | | | | |
| M & C Plan | | | | | |
| Credit Schedule | | | | | |
| Kind | | | | | |
| Location | | | | | |
| Sum of m Factors | M ₁ = | M ₂ = | M ₃ = | M ₄ = | M ₅ = |
| Mitigation Area | A ₁ = | A ₂ = | A ₃ = | A ₄ = | A ₅ = |
| M x A = | | | | | |

Total Creation Credits = $\sum (M \times A) =$

Compensatory Mitigation Credit Factors and Worksheets

RESTORATION AND ENHANCEMENT MITIGATION FACTORS

| Factors | Options | | | | |
|---------------------------------|---|-------------------|-------------------|--------------------|-------------------|
| Net Improvement | Modest Enhancement 0.1 ----- to ----- 2.0 Excellent Restoration | | | | |
| Soils | | N. A. 0 | U. S. S. 0 | T. S. S. 0.1 | E. S. S. † 0.3 |
| Hydrology | | N. A. 0 | Mechanical 0 | Created 0.1 | Natural † 0.3 |
| Vegetation | | | N. A. 0 | Natural † 0.1 | Planted 0.3 |
| Maintenance | | N. A. † 0 | Moderate 0 | Low 0.1 | None 0.3 |
| Monitoring & Contingencies Plan | N. A. † 0 | Minimum 0.1 | Moderate 0.2 | Substantial 0.3 | Strong 0.4 |
| Credits Schedule | Schedule 5 0 | Schedule 4 0.1 | Schedule 3 0.2 | Schedule 2 0.3 | Schedule 1 0.4 |
| Kind | Category 5 0.1 | Category 4 0.2 | Category 3 0.3 | Category 2 0.4 | Category 1 0.5 |
| Location | Zone 5 0.1 | Zone 4 0.2 | Zone 3 0.3 | Zone 2 0.4 | Zone 1 0.5 |

N. A. = Not Applicable

† Use this option to calculate credits for enhancement by buffering.

Proposed Restoration or Enhancement Mitigation Sample Worksheet

| Factor | Area 1 | Area 2 | Area 3 | Area 4 | Area 5 |
|------------------|------------------|------------------|------------------|------------------|------------------|
| Net Improvement | | | | | |
| Soils | | | | | |
| Hydrology | | | | | |
| Vegetation | | | | | |
| Maintenance | | | | | |
| M & C Plan | | | | | |
| Credit Schedule | | | | | |
| Kind | | | | | |
| Location | | | | | |
| Sum of m Factors | M ₁ = | M ₂ = | M ₃ = | M ₄ = | M ₅ = |
| Mitigation Area | A ₁ = | A ₂ = | A ₃ = | A ₄ = | A ₅ = |
| M × A | | | | | |

Total Restoration/Enhancement Credits = $\sum (M \times A) =$

Compensatory Mitigation Credit Factors and Worksheets

PRESERVATION MITIGATION FACTORS

| Factors | Options | | | | | |
|------------------|---------------------------|-----------------|-------------------|--------------------|-------------------|-------------------|
| | Subdivided 0.1 | Private 0.2 | POA 0.3 | Conservancy 0.4 | | |
| Degree of Threat | None 0 | Low 0 | Moderate 0.1 | High 0.2 | | |
| Kind | Buffers [†] 0 | Category 5 0 | Category 4 0.1 | Category 3 0.2 | Category 2 0.3 | Category 1 0.4 |
| Location | Buffers [†] 0 | Zone 5 0 | Zone 4 0.1 | Zone 3 0.2 | Zone 2 0.3 | Zone 1 0.4 |

[†] When allowed, upland buffers are given a value of zero for kind and location factors.

The following definitions are reproduced here for ready reference.

Category 1 is **In-Kind for non-mitigation banks** and is specially defined for mitigation banks.

Category 2 is defined for each mitigation bank following an assessment of the bank.

Category 3 is defined for each mitigation bank following an assessment of the bank.

Category 4 is **Out-of-Kind for non-mitigation banks** and is specially defined for mitigation banks.

Category 5 is defined for each mitigation bank following an assessment of the bank.

Zone 1 means **On-Site for non-mitigation banks** and is specially defined for mitigation banks.

Zone 2 means **Inside for non-mitigation banks** and is specially defined for mitigation banks.

Zone 3 is defined for each mitigation bank following an assessment of the bank.

Zone 4 means **Outside for non-mitigation banks** and is specially defined for mitigation banks.

Zone 5 is defined for each mitigation bank following an assessment of the bank.

When an exception is approved to allow mitigation credit for buffer zones, the buffers are given a value of zero for the kind and location factors. Mitigation Banks shall not be used as compensatory mitigation for impacts which do not clearly fit into one of the defined categories or which are outside of the bank's defined zones unless approved on a case specific basis.

Proposed Preservation Mitigation Sample Worksheet

| Factor | Area 1 | Area 2 | Area 3 | Area 4 | Area 5 |
|------------------|------------------|------------------|------------------|------------------|------------------|
| Control | | | | | |
| Threat | | | | | |
| Kind | | | | | |
| Location | | | | | |
| Sum of m Factors | M ₁ = | M ₂ = | M ₃ = | M ₄ = | M ₅ = |
| Mitigation Area | A ₁ = | A ₂ = | A ₃ = | A ₄ = | A ₅ = |
| M × A | | | | | |

Total Preservation Credits = $\sum (M \times A) =$

Compensatory Mitigation Credit Factors and Worksheets

Mitigation Summary Worksheet For Permit Application # _____

I. Required Mitigation

| | |
|--|--|
| A. Total Required Mitigation Credits = | |
|--|--|

II. Non-Banking Mitigation Credit Summary

Credits

Acres

| | | |
|--|--|--|
| B. Creation | | |
| C. Restoration and/or Enhancement | | |
| D. Total No Net Loss Non-Bank Mitigation = B + C | | |
| E. Preservation | | |
| F. Total Proposed Non-Bank Mitigation = D + E | | |

III. Banking Mitigation Credit Summary

Credits

Acres

| | | |
|--|--|--|
| G. Creation | | |
| H. Restoration and/or Enhancement | | |
| I. Total No Net Loss Bank Mitigation = G + H | | |
| J. Preservation | | |
| K. Total Proposed Bank Mitigation = I + J | | |

IV. Grand Totals

Credits

Acres

| | | |
|--|--|--|
| L. Total Preservation Mitigation = E + J | | |
| M. Total Non-Preservation Mitigation = D + I | | |
| N. Total Proposed Mitigation = F + K | | |

The total Mitigation Credits (Row N) should be equal to or greater than the total Required Mitigation Credits (Row A) for the proposed mitigation to be acceptable. The other requirements given in the SOP must also be satisfied, e.g., Row M must equal at least 50% of Row A, etc. If the answer to either of the questions below is no, then the proposed mix and/or quantity of mitigation is not in compliance with the policy and the plan should be revised or rejected, unless a variance is approved.

| | Yes | No |
|---|-----|----|
| $PMC \geq RMC$ or in words Are the Credits in Row N greater than or equal to Row A ? | | |
| $PMC_{\text{Non-Preservation}} \geq \frac{1}{2} RMC$ or in words Are the Credits in Row M greater than or equal to 50% of Row A ? | | |

Fixed or Variable Credits Mitigation Banks Sample Acres Accounting Record

| | | ACRES | | | |
|--------|-------------|--------------------|-----------|------------------|--------|
| Date | Reference # | Used (i.e. debits) | Remaining | Used + Remaining | % Used |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| TOTALS | | | | | |

I certify that the above accounting is an accurate and complete record of mitigation acres in accordance with the Memorandum of Agreement for the _____ Mitigation Bank which is dated _____.

Date

For banks with multiple units, separate accounting records must be submitted for each unit of the bank and for the bank as a whole. On accounting sheets for bank units, list the permit number for which credits are being used in the reference column and the applicable bank unit number or name in the sheet's title line. On accounting sheets for the whole bank, list each bank unit in the reference column and the bank's name in the title line.

Compensatory Mitigation Credit Factors and Worksheets

A Fixed Credits Mitigation Bank Sample Credits Accounting Record

CREDIT ACCOUNTING RECORD FOR (see notes below)

| | | CREDITS | | |
|--------|-------------|--------------------|-----------|------------------|
| Date | Reference # | Used (i.e. debits) | Remaining | Used + Remaining |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| TOTALS | | | | |

Sheet # ____ of ____

I certify that the above accounting is an accurate and complete record of mitigation credits in accordance with the Memorandum of Agreement for the _____ Mitigation Bank which is dated _____.

Name Signature

Date

Name Signature

Date

Notes for Bank Operators:

For banks with multiple units, separate accounting records must be submitted for each unit of the bank and for the bank as a whole. On accounting sheets for bank units, list the permit number for which credits are being used in the reference column and the applicable bank unit number or name in the sheet's title line. On accounting sheets for the whole bank, list each bank unit in the reference column and the bank's name in the title line.

Compensatory Mitigation Credit Factors and Worksheets

A Variable Credits Mitigation Bank Sample Credits Accounting Record

CREDIT ACCOUNTING RECORD FOR (see notes below)

| Date | Reference # | CREDITS | | | | |
|--------|-------------|-----------------------|-----------|---------|------------------|---------|
| | | Used (i.e. debits) | Remaining | | Used + Remaining | |
| | | | Minimum | Maximum | Minimum | Maximum |
| | | | | | | |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| TOTALS | | | | | | |

Sheet # ____ of ____

I certify that the above accounting is an accurate and complete record of mitigation credits in accordance with the Memorandum of Agreement for the _____ Mitigation Bank which is dated _____.

Name Signature

Date

Name Signature

Date

Notes for Bank Operators:

For banks with multiple units, separate accounting records must be submitted for each unit of the bank and for the bank as a whole. On accounting sheets for bank units, list the permit number for which credits are being used in the reference column and the applicable bank unit number or name in the sheet's title line. On accounting sheets for the whole bank, list each bank unit in the reference column and the bank's name in the title line.

A Fixed Credits Mitigation Bank

Sample Combined Acres and Credits Accounting Record

ACCOUNTING RECORD FOR SAMPLE MITIGATION BANK

Sheet # ____ of ____

Date

Compensatory Mitigation

Sample Case #1

All Mitigation On-Site

Assume that the impacts involve permanent fill of 1 acre of Type A, Class 2 waters for construction of a dam, Impounding 5 acres of Type A, Class 2 waters, and permanent access roads over 0.4 acres of Type C, Class 1 waters. The rarity ranking for all areas is common. The mitigation consists of restoring 9 acres of prior converted agricultural land to a natural forested wetlands and preservation of 15.1 acres of isolated wetlands by donation to a conservancy. The plan includes a 3 year monitoring plan, restoration of the natural hydrology by filling drainage ditches, and suitable planting of vegetation in the restoration area. No perpetual maintenance will be required. The restoration site is adjacent to the proposed inundated area and the mitigation will be done concurrently with the proposed activity.

REQUIRED MITIGATION CREDITS

| Area | Magnitude | Dominant Effect | Duration of Effect | Existing Condition | Rarity Ranking | Lost Kind | Preventability | Sum R | Impact Area AA | Product R × AA |
|--------|-----------|-----------------|--------------------|--------------------|----------------|-----------|----------------|-------|----------------|----------------|
| Area 1 | 0.3 | 2.0 | 2.0 | 1.5 | 0.1 | 2.0 | 1.0 | 8.9 | 1.0 | 8.9 |
| Area 2 | 0.3 | 1.8 | 2.0 | 1.5 | 0.1 | 2.0 | 1.0 | 8.7 | 5.0 | 43.5 |
| Area 3 | 0.3 | 2.0 | 2.0 | 2.0 | 0.1 | 1.0 | 0.5 | 7.9 | 0.4 | 3.2 |

Total Required Credits = 55.6

RESTORATION CREDITS

| | |
|---------------------|-----|
| Net Improvement | 1.5 |
| Soils | 0.3 |
| Hydrology | 0.3 |
| Vegetation | 0.3 |
| Maintenance | 0.3 |
| M & C Plan | 0.1 |
| Schedule | 0.2 |
| Kind | 0.5 |
| Location | 0.5 |
| M = Sum of Factors | 4.0 |
| A = Mitigation Area | 9.0 |

Credits = M × A = 36.0

PRESERVATION CREDITS

| | |
|---------------------|------|
| Control | 0.4 |
| Degree of Threat | 0.1 |
| Kind | 0.4 |
| Location | 0.4 |
| M = Sum of Factors | 1.3 |
| A = Mitigation Area | 15.1 |

Credits = M × A = 19.63

SUMMARY OF MITIGATION CREDITS

| Category | Credits |
|--------------|---------|
| Preservation | 19.63 |
| Restoration | 36.00 |

Total Credits = Σ (M × A) = 55.63

PMC ≥ RMC

55.63 ≥ 55.6

PMC_{Non-Preservation} ≥ ½ RMC

36.0 ≥ 27.8

The Total Proposed Mitigation Credits (55.63) are greater than the Total Required Mitigation Credits (55.6) and the credits for restoration are greater than ½ of the required credits. Therefore, the quantity and mix of mitigation is acceptable. The Project Manager must also review the other aspects of the mitigation plan to assure that it is generally in compliance with the policies and guidelines for mitigation.

Compensatory Mitigation
Sample Case #2
On-Site Mitigation Combined With Mitigation Bank Credits

For this sample case let us assume that the impacts are the same as in the previous case sample. Thus we need 55.6 mitigation credits. Also assume the proposed 15.1 acres of preservation is the same giving us the previously calculated 19.63 credits of preservation. However, instead of 9.0 acres of on-site restoration, assume only 5.0 acres of on-site restoration is proposed and the remaining required credits will be obtained from a Mitigation Bank. Similar to the previous example we can quickly calculate the following.

$$\begin{aligned}\text{Proposed Non-Bank Preservation} &= 1.3 \times 15.1 = 19.63 \\ \text{Proposed Non-Bank Restoration} &= 4.0 \times 5.0 = \underline{20.00} \\ \text{Total Proposed Non-Bank Mitigation Credits} &= \mathbf{39.63}\end{aligned}$$

The additional credits needed are:

$$\begin{aligned}\text{Total Mitigation Credits Required} &= 55.60 \\ \text{Total Proposed Non-Bank Credits} &= \underline{39.63} \\ \text{Additional Credits Needed} &= \mathbf{15.97}\end{aligned}$$

We also must consider the no net loss requirement that at least half of the mitigation credits should be from categories other than pure preservation. Since a Mitigation Bank may offer preservation or non-preservation credits, we need to know the number of non-preservation credits needed.

$$\begin{aligned}\text{Non-Preservation Credits Required} &= \frac{1}{2} \times 55.6 = 27.80 \\ \text{Proposed Non-Preservation Credits} &= \underline{20.00} \\ \text{Additional Non-Preservation Credits Needed} &= \mathbf{7.80}\end{aligned}$$

The applicant then obtains 15.97 credits from a mitigation bank of which 7.8 are non-preservation credits. The remaining 8.17 are bank preservation credits. The bank operator reports this consumed 1.1 acre of non-preservation and 4 acres of preservation in the bank. The completed summary worksheet is as follows.

| | | |
|---|----------------|--------------|
| I. Required Mitigation | | |
| Total Required Mitigation Credits = 55.60 | | |
| II. Non-Banking Mitigation | Credits | Acres |
| Preservation | 19.63 | 15.1 |
| Restoration / Enhancement | 20.00 | 5.0 |
| Total Non-Bank Mitigation | 39.63 | 20.1 |
| III. Banking Mitigation | Credits | Acres |
| Preservation | 8.17 | 4.0 |
| Non-Preservation | 7.80 | 1.1 |
| Total Banking Mitigation | 15.97 | 5.1 |
| IV. Grand Totals | Credits | Acres |
| <i>Total Preservation</i> | 27.80 | 19.1 |
| <i>Total Non-Preservation</i> | 27.80 | 6.1 |
| <i>Total Mitigation</i> | 55.60 | 25.2 |

The Grand Total proposed credits are equal to the required credits and the Grand Total Non-Preservation credits are equal to at least half of the total required credits. Therefore, the proposed mix and types of mitigation satisfy the policy. The number of acres required from the bank to obtain these credits will depend upon the approved banking documents and must be calculated by the bank operator. The calculation of bank acres used should be submitted with both the project mitigation proposal and the regular accounting summary for the Mitigation Bank.

**Compensatory Mitigation
Sample Case #3
A Fixed Credits Mitigation Bank**

This sample case demonstrates application of the Mitigation SOP to a Mitigation Bank proposal setup to provide a fixed number of mitigation credits in the bank. This Sample Bank consists of 4 units defined in the Banking Agreement document. The classification scheme used could be whatever the Mitigation Bank Review Team (MBRT) finds suitable for the particular banking proposal. For this example assume the bank units are chosen as follows.

Diagram for Sample Fixed Credits Mitigation Bank Classification Scheme

| | |
|--|--|
| <p style="text-align: center;">Unit # 1 160 acres</p> <p>Agricultural Fields being restored to natural wetlands.</p> | <p style="text-align: center;">Unit #2 50 acres</p> <p>Hardwood Forest wetlands being enhanced by filling drainage ditches to restore natural hydrology.</p> |
| <p style="text-align: center;">Unit #3 100 acres</p> <p>Bedded Pine wetlands being returned to natural wetlands.</p> | <p style="text-align: center;">Unit #4 40 acres</p> <p>Preservation of wetlands with upland inclusions.</p> |

When complete, the wetlands provided in this bank will be adjacent to riverine systems. All units except the preservation area will be restored and/or enhanced as wetlands. A conservation easement will be placed on the entire mitigation bank area. The MBRT and the Bank Operator have agreed that the method of calculating bank credits given in the Mitigation SOP is acceptable for this bank. Therefore, the MBRT has assigned credit factors from the tables given in the SOP to each unit of the bank. Tables for each bank unit have been prepared using the assigned factors. In addition, the Team has reviewed the bank proposal and determined appropriate categories for the Location and Kind factors. Bank specific tables and definitions will be made a part of the Banking Agreement.

Unique Definitions for Sample Fixed Credits Mitigation Bank.

Except for Kind and Location, which are defined below, the terms used in this Sample Mitigation Banking Proposal are as defined in the current edition of the Mitigation SOP. Also, as stated in the banking agreement, credits in Pine Forest areas cannot be used until after tree harvesting and restoration of these areas.

Kind is a factor used to compare the relative functions and values of the mitigation site to the impact site. For the purposes of this Sample Mitigation Bank it has been decided that this bank can only be used as compensation for impacts to riverine (i.e. adjacent) wetlands without regard to annual flow rates. Since other kinds will not be allowed, all impacts are calculated using a Category #1 Kind Factor. The Sample Mitigation Bank shall not be used as compensatory mitigation for wetland types which do not fit into the specified Kind category given above unless approved on a case specific basis.

Location is a factor used to compare the relative location of the mitigation site to the impact site. For the purposes of this Sample Mitigation Bank it has been decided that this mitigation bank can only be used as compensation for impacts within the bank's watershed and within Service Unit Area 2A. This specified area is designated as Zone #1 for this bank. The Service Unit Areas are defined and shown in the attachments to the Joint Federal and State Standard Operating Procedures for Mitigation Banking. A copy of the information defining these Service Unit Areas is included in the Mitigation Bank Plan. The Sample Mitigation Bank shall not be used as compensatory mitigation for impacts which are outside of Zone #1 unless approved on a case specific basis.

Compensatory Mitigation
Sample Case #3
A Fixed Credits Mitigation Bank (continued)

BANK RESTORATION AND/OR ENHANCEMENT CREDITS

| Factor | Unit 1 | Unit 2 | Unit 3 |
|---------------------|-------------|-------------|-------------|
| Net Improvement | 1.6 | 0.6 | 0.4 |
| Soils | 0.3 | 0.3 | 0.3 |
| Hydrology | 0.3 | 0.3 | 0.3 |
| Vegetation | 0.3 | 0.3 | 0.1 |
| Maintenance | 0.3 | 0.3 | 0.3 |
| M & C Plan | 0.2 | 0.2 | 0.2 |
| Credit Schedule | 0.1 | 0.1 | 0.1 |
| Kind | 0.5 | 0.5 | 0.5 |
| Location | 0.5 | 0.5 | 0.5 |
| Sum of m Factors | $M_1 = 4.1$ | $M_2 = 3.1$ | $M_3 = 2.7$ |
| Acres of Mitigation | $A_1 = 160$ | $A_2 = 50$ | $A_3 = 100$ |
| $M \times A$ | 656 | 155 | 270 |

$$\text{Credits} = \sum (M \times A) = 1081$$

BANK PRESERVATION CREDITS

| Factor | Unit #4 |
|---------------------|-----------|
| Control | 0.4 |
| Threat | 0.1 |
| Kind | 0.4 |
| Location | 0.4 |
| Sum of m Factors | $M = 1.3$ |
| Acres of Mitigation | $A = 40$ |
| $M \times A$ | 52 |

$$\text{Credits} = \sum (M \times A) = 52$$

SAMPLE FIXED CREDITS BANK SUMMARY

| Unit | Credits | Acres |
|---------------------|-------------|------------|
| Unit #1 | 656 | 160 |
| Unit #2 | 155 | 50 |
| Unit #3 | 270 | 100 |
| Unit #4 | 52 | 40 |
| Grand Totals | 1133 | 350 |

The number of credits the bank operator may be able to sell will be not more than 1133. Of this total, 52 credits are classified as preservation and the remaining 1081 credits are classified as non-preservation.

The total acres in the bank will be 350. When credits are used, both the number of credits and acres consumed are calculated and recorded. When all 350 acres have been consumed, no more credits may be sold from the bank.

Compensatory Mitigation

Sample Case #4

A Variable Credits Mitigation Bank

This sample case demonstrates application of the Mitigation SOP to a Mitigation Bank proposal which contains multiple units and sub-units. The credit and debit accounting procedures allow flexibility in the design of Mitigation Banks allowing an infinite number of possible combinations of units and sub-units. The classification scheme used could be whatever the Mitigation Bank Review Team (MBRT) finds suitable for the particular banking proposal. For this example assume the units and sub-units are specified as follows.

Diagram for Sample Variable Credits Mitigation Bank

| Bank Phase #1 200 Acres | | Bank Phase #2 230 Acres | |
|--|--|--|---|
| Sub-Unit 1A 160 acres Agricultural Fields being restored to natural wetlands. | Sub-Unit 1B 20 acres Bedded Pine wetlands being returned to natural wetlands. | Sub-Unit 2A 150 acres Agricultural Fields being restored to natural wetlands. | Sub-Unit 2B 50 Acres Hardwood Forest wetlands being enhanced. |
| Sub-Unit 1C 10 acres Scrub Shrub wetlands being returned to natural wetlands. | Sub-Unit 1D 10 acres Preservation of wetlands and upland inclusions. | Sub-Unit 2C 10 acres Scrub Shrub wetlands being returned to natural wetlands. | Sub-Unit 2D 20 acres Preservation of wetlands and upland inclusions. |

All sub-units except the preservation areas will be restored and/or enhanced as wetlands. A conservation easement will be placed on the entire mitigation bank. The MBRT and the Bank Operator have agreed that the method of calculating bank credits given in the Mitigation SOP is acceptable for this bank. The MBRT has assigned credit factors from the tables given in the SOP to each sub-unit of the bank. As stated in the banking agreement, mitigation credits in Pine Forest areas cannot be used until after tree harvesting and restoration of these areas. In addition, the MBRT has reviewed the bank proposal and determined appropriate categories for the Location and Kind factors. Tables and definitions are included in the Bank Plan.

Unique Definitions for Sample Mitigation Bank.

Except for Kind and Location, which are defined below, the terms used in the Sample Mitigation Banking Plan are as defined in the current edition of the ACE Mitigation SOP.

Kind is a factor used to compare the relative functions and values of the mitigation site to the impact site. The Sample Mitigation Bank shall not be used as compensatory mitigation for any type which does not fit into one of the categories given below unless approved on a case specific basis. For the purposes of the Sample Mitigation Bank, the kind categories are defined as follows.

Category 1 is riverine (i.e. adjacent) wetlands where the nearby mean annual flow rate is 5 cfs or more.

Category 2 is forested isolated wetlands.

Category 3 is cypress dominated (25+%) and/or tupelo dominated (25+%) swamp systems.

Category 4 is riverine (i.e. adjacent) wetlands where the nearby mean annual flow rate is below 5 cfs.

Category 5 is pine flat wetlands and non-forested isolated wetlands.

Location is a factor used to compare the relative location of the mitigation site to the impact site. The Sample Mitigation Bank shall not be used as compensatory mitigation for impacts which are outside of the zones given below unless approved on a case specific basis. Service Unit Areas are defined in the Joint Federal and State Standard Operating Procedures for Mitigation Banking. For the purposes of the Sample Mitigation Bank, the location categories are defined as follows.

Zone 1 means Service Unit Area 2B.

Zone 2 means Service Unit Area 2C.

Zone 3 means Service Unit Area 2A.

Zone 4 means Service Unit Area 1B.

Zone 5 means Service Unit Area 1A.

Compensatory Mitigation
Sample Case #4
A Variable Credits Mitigation Bank (continued)

PHASE #1 RESTORATION AND/OR ENHANCEMENT CREDITS

| Factor | Sub-Unit 1A | Sub-Unit 1B | Sub-Unit 1C |
|---------------------|-----------------------------|-----------------------------|-----------------------------|
| Net Improvement | 1.6 | 0.6 | 0.4 |
| Soils | 0.3 | 0.3 | 0.3 |
| Hydrology | 0.3 | 0.3 | 0.3 |
| Vegetation | 0.3 | 0.3 | 0.1 |
| Maintenance | 0.3 | 0.3 | 0.3 |
| M & C Plan | 0.2 | 0.2 | 0.2 |
| Credit Schedule | 0.1 | 0.1 | 0.1 |
| Kind | .1 to .5 | .1 to .5 | .1 to .5 |
| Location | .1 to .5 | .1 to .5 | .1 to .5 |
| Sum of m Factors | $M_1 = 3.3 \text{ to } 4.1$ | $M_2 = 2.3 \text{ to } 3.1$ | $M_3 = 1.9 \text{ to } 2.7$ |
| Acres of Mitigation | $A_1 = 160$ | $A_2 = 20$ | $A_3 = 10$ |
| $M \times A$ | 528 to 656 | 46 to 62 | 19 to 27 |

Credits = $\sum (M \times A)$ = 593 to 745

PHASE #2 RESTORATION AND/OR ENHANCEMENT CREDITS

| Factor | Sub-Unit 2A | Sub-Unit 2B | Sub-Unit 2C |
|---------------------|-----------------------------|-----------------------------|-----------------------------|
| Net Improvement | 1.6 | 0.4 | 0.4 |
| Soils | 0.3 | 0.3 | 0.3 |
| Hydrology | 0.3 | 0.3 | 0.3 |
| Vegetation | 0.3 | 0.3 | 0.1 |
| Maintenance | 0.3 | 0.3 | 0.3 |
| M & C Plan | 0.3 | 0.3 | 0.2 |
| Credit Schedule | 0.1 | 0.1 | 0.1 |
| Kind | .1 to .5 | .1 to .5 | .1 to .5 |
| Location | .1 to .5 | .1 to .5 | .1 to .5 |
| Sum of m Factors | $M_1 = 3.4 \text{ to } 4.2$ | $M_2 = 2.2 \text{ to } 3.0$ | $M_3 = 1.9 \text{ to } 2.7$ |
| Acres of Mitigation | $A_1 = 150$ | $A_2 = 50$ | $A_3 = 10$ |
| $M \times A$ | 510 to 630 | 110 to 150 | 19 to 27 |

Credits = $\sum (M \times A)$ = 639 to 807

Compensatory Mitigation
Sample Case #4
A Variable Credits Mitigation Bank (continued)

SAMPLE BANK PRESERVATION CREDITS

| Factors | Sub-Unit #1D | Sub-Unit #2D |
|---------------------|-----------------------------|-----------------------------|
| Control | 0.4 | 0.4 |
| Threat | 0.1 | 0.1 |
| Kind | .1 to .4 | .1 to .4 |
| Location | .1 to .4 | .1 to .4 |
| Sum of m Factors | $M_1 = 0.7 \text{ to } 1.3$ | $M_2 = 0.7 \text{ to } 1.3$ |
| Acres of Mitigation | $A_1 = 10$ | $A_2 = 20$ |
| $M \times A$ | 7 to 13 | 14 to 26 |

$$\text{Credits} = \sum (M \times A) = \boxed{21 \text{ to } 39}$$

SAMPLE VARIABLE CREDITS BANK SUMMARY

| Unit | Minimum Credits | Maximum Credits | Acres |
|---------------------|------------------------|------------------------|--------------|
| Unit #1A | 528 | 656 | 160 |
| Unit #1B | 46 | 62 | 20 |
| Unit #1C | 19 | 27 | 10 |
| Unit #2A | 510 | 630 | 150 |
| Unit #2B | 110 | 150 | 50 |
| Unit #2C | 19 | 27 | 10 |
| Unit #1D | 7 | 13 | 10 |
| Unit #2D | 14 | 26 | 20 |
| Grand Totals | 1253 | 1591 | 430 |

The number of credits the bank operator may be able to sell will be not less than 1253 and not more than 1591. This credit range is due to the different zones and kinds for impacts which are allowed to use the bank. The bank will have no less than 21 and no more than 39 preservation credits.

The total acres in the bank will be 430. When credits are used, both the number of credits and acres consumed is calculated and recorded. When all 430 acres have been consumed, no more credits may be sold from the bank.

Note: To design a bank with a fixed number of credits, designate only one kind factor and one location factor for each bank unit. This requires excluding use of bank units for projects which do not meet the single kind or the single location factor limitations of that unit.

**Compensatory Mitigation
Restrictive Covenants Model**
(Note: verify current version before using this model)

STATE OF SOUTH CAROLINA

**DECLARATION OF
RESTRICTIVE COVENANTS**

COUNTY OF _____

THIS DECLARATION OF RESTRICTIVE COVENANTS is made this ____ day of _____, 19__, by _____ ("Declarant(s)").

RECITALS

WHEREAS, Declarant(s) is/are the owner(s) of certain real property [*"real property" includes wetlands, lands underlying other waters of the U.S., uplands, associated riparian/littoral rights*] located in _____ County, South Carolina, more particularly described [*describe tract to be preserved, including: 1) acreage, 2) either a reference to recorded plat(s), or attach an approved permit drawing or site plan - see Paragraph 9, and 3) any excluded property*] ("Property"); and

WHEREAS, in consideration of the issuance of Department of the Army Permit No. _____ ("Permit") to Declarant(s) by the U.S. Army Corps of Engineers, Charleston District ("Corps," to include any successor agency), and certification(s) and/or permit(s) by the S.C. Department of Health and Environmental Control ("DHEC," to include any successor agency), and for the protection or enhancement of the Property's wetlands, scenic, conservation, resource, environmental, or other values, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Declarant(s) has/have agreed to place certain restrictive covenants on the Property, in order that the Property shall remain substantially in its natural condition forever, as provided herein.

NOW THEREFORE, Declarant(s) hereby declare(s) that the Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of and used subject to the following restrictive covenants, which shall run with the land and be binding on all heirs, successors, assigns, lessees, or other occupiers and users.

1. Declarant(s) is/are and shall be prohibited from the following: filling, draining, flooding, dredging, impounding, clearing, burning, cutting or destroying vegetation, cultivating, excavating, erecting, constructing, or otherwise doing any work on the Property; introducing exotic species into the Property; and from changing the grade or elevation, impairing the flow or circulation of waters, reducing the reach of waters, and any other discharge or activity requiring a permit under clean water or water pollution control laws and regulations, as amended. The following are expressly excepted from this paragraph: a) cumulatively very small impacts associated with hunting (excluding planting or burning), fishing, and similar recreational activities, consistent with the continuing natural condition of the Property [*reference may also be made to the Permit, or to a mitigation plan approved by the Permit, provided all exceptions (including those relating to buffer areas) are specifically spelled out in the Permit or plan; OR, additional exceptions may be specifically listed in this paragraph, e.g., fire or wildlife management plans*].

**Compensatory Mitigation
Restrictive Covenants Model**
(Note: verify current version before using this model)

2. After recording, these restrictive covenants may be altered by modification of the Permit pursuant to applicable Corps regulations and policy, provided all agencies that certified the Permit concur with the modification, and subject to consultation with other resource agencies as appropriate. Such modifications become a part of these restrictive covenants. Declarant may request to trade in entirety property that is not encumbered by conservation easements or covenants for the Property herein, provided such substitute property is of equivalent functions and values as the Property herein, and is placed under equivalent conservation restrictions.

3. Any permit application, or request for certification or modification, which may affect the Property, made to any governmental entity with authority over wetlands or other waters of the United States, shall expressly reference and include a copy of these restrictive covenants.

4. It is expressly understood and agreed that these restrictive covenants do not grant or convey to members of the general public any rights of ownership, entry or use of the Property. These restrictive covenants are created solely for the protection of the Property, wetlands, and associated values, and Declarant(s) reserve(s) the ownership of the fee simple estate and all rights appertaining thereto, including without limitation the rights to exclude others and to use the property for all purposes not inconsistent with these restrictive covenants.

5. The Corps, DHEC, and its/their authorized agents shall have the right to enter and go upon the lands of the Declarant(s), to inspect the Property and take actions necessary to verify compliance with these restrictive covenants.

6. The Declarant(s) grant(s) to the Corps, the U.S. Department of Justice, and/or DHEC, a discretionary right to enforce these restrictive covenants in a judicial action against any person(s) or other entity(ies) violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. In any enforcement action, an enforcing agency shall be entitled to a complete restoration for any violation, as well as any other judicial remedy. An enforcing agency shall also be entitled to costs and attorneys fees in any enforcement action in which it obtains relief. Nothing herein shall limit the right of the Corps to modify, suspend, or revoke the Permit.

7. Declarant(s) shall include the following warning on all deeds, mortgages, plats, or any other legal instruments used to convey any interest in the Property:

WARNING: This Property Subject to Declaration of Restrictive Covenants
Recorded at [insert book and page numbers (if Property lies in more than one county,
of same county(ies) as instrument(s)) of Declaration].

8. The perimeter of the Property shall at all times be plainly marked by permanent signs saying, "Protected Natural Area," or by an equivalent, permanent marking system.

**Compensatory Mitigation
Restrictive Covenants Model**
(Note: verify current version before using this model)

[Paragraph 9 - generally, a surveyed, recorded plat is required; however, at the discretion of the Corps and DHEC, an approved permit drawing or site plan attached to these restrictive covenants may suffice]

9. A plat depicting the boundaries of the Property subject to these restrictive covenants shall be recorded in the RMC office for each county in which the Property is situated prior to the recording of these restrictive covenants. The plat(s) is/are recorded at *[include book and page references, county(ies), and date of recording]*.

10. Should any separable part of these restrictive covenants be determined to be contrary to law, the remainder shall continue in full force and effect.

IN WITNESS WHEREOF, the Declarant(s) has/have duly executed this Declaration of Restrictive Covenants the date written above.

IN THE PRESENCE OF:

Declarant(s)

By: _____

Its: _____

STATE OF SOUTH CAROLINA

P R O B A T E

COUNTY OF

PERSONALLY appeared before me _____, the undersigned witness, and made oath that he/she saw the within named _____
[, by _____, its _____,] sign, seal and as his/her/its act and deed, deliver the within named Declaration of Restrictive Covenants; and that he/she with the other witness named above witnessed the execution thereof.

[signature of witness]

SWORN to and subscribed before me
this ____ day of _____, 19__.

NOTARY PUBLIC FOR SOUTH CAROLINA

My Commission Expires:

Compensatory Mitigation

Calculating Unmitigated Acres

For special cases it may be necessary to calculate the remaining unmitigated acres of impacts. This might be necessary if a mitigation plan proposes use of a mitigation bank for which credits are calculated in a manner incompatible with the current SOP. The formula, example, and verification that follow demonstrate calculation of the remaining unmitigated acres for a mitigation project. Except as shown, all terms are as defined in the SOP.

Unmitigated Acres Formula:

$$\text{Unmitigated Acres} = \sum_{i=1}^N (AA_i)_{\text{Remaining}} = \frac{\text{RMC}_{\text{Remaining}}}{\text{RMC}} \times \sum_{i=1}^N AA_i$$

with the following terms defined,

$(AA_i)_{\text{Remaining}}$ = The remaining unmitigated acreage of the i^{th} adverse impact area

$\text{RMC}_{\text{Remaining}} = \text{RMC} - \text{PMC}_{\text{SOP}}$

PMC_{SOP} = Proposed Mitigation Credits calculated using the SOP

Example Case:

For example, assume a project has an RMC of 67.0 for 8.0 acres of adverse impacts. Also, assume the applicant proposes a mitigation plan with a PMC of 40 credits from onsite mitigation and the remaining credits provided from a mitigation bank which calculates credits differently than the SOP. The unmitigated acres is calculated as follows.

$$\text{Unmitigated Acres} = \frac{\text{RMC}_{\text{Remaining}}}{\text{RMC}} \times \sum_{i=1}^N AA_i$$

$$\text{Unmitigated Acres} = \frac{67 - 40}{67} \times 8.0$$

$$\text{Unmitigated Acres} = 3.224 \text{ acres}$$

The credits consumed in the mitigation bank are then calculated based on 3.224 acres of unmitigated impacts.

Mathematical Verification:

The next page gives the mathematical verification for this procedure. If you don't need or want to see more math, then you can stop reading now. It is not necessary to understand the mathematical verification to apply this procedure.

Compensatory Mitigation

Calculating Unmitigated Acres

The mathematical verification for the unmitigated acres formula is shown below.

For a given adverse impact area AA_i , the value of R_i is a constant by definition. Therefore, the remaining unmitigated portion of the RMC varies based on the remaining unmitigated acres. This relationship is shown as follows.

$$RMC_{\text{Remaining}} = \sum_{i=1}^N (R_i \times (AA_i)_{\text{Remaining}})$$

Which expands to give,

$$\text{Equation \#1 } RMC_{\text{Remaining}} = R_1 \times (AA_1)_{\text{Remaining}} + R_2 \times (AA_2)_{\text{Remaining}} + \dots$$

We can derive another equation for the value of $RMC_{\text{Remaining}}$ as follows.

$$\begin{aligned} RMC &= \sum_{i=1}^N (R_i \times AA_i) \\ RMC &= (R_1 \times AA_1) + (R_2 \times AA_2) + (R_3 \times AA_3) + \dots \\ RMC \times \left(\frac{RMC_{\text{Remaining}}}{RMC} \right) &= [(R_1 \times AA_1) + (R_2 \times AA_2) + (R_3 \times AA_3) + \dots] \times \left(\frac{RMC_{\text{Remaining}}}{RMC} \right) \end{aligned}$$

$$\text{Equation \#2 } RMC_{\text{Remaining}} = R_1 \times \left(AA_1 \times \frac{RMC_{\text{Remaining}}}{RMC} \right) + R_2 \times \left(AA_2 \times \frac{RMC_{\text{Remaining}}}{RMC} \right) + \dots$$

By comparing equations 1 and 2 we derive the following relationships which verifies the formula.

$$\begin{aligned} (AA_i)_{\text{Remaining}} &= AA_i \times \frac{RMC_{\text{Remaining}}}{RMC} \\ \sum_{i=1}^N (AA_i)_{\text{Remaining}} &= \sum_{i=1}^N \left(AA_i \times \frac{RMC_{\text{Remaining}}}{RMC} \right) \\ \text{Unmitigated Acres} &= \frac{RMC_{\text{Remaining}}}{RMC} \times \sum_{i=1}^N AA_i \end{aligned}$$